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TOSHIBA Photocoupler GaAs IRed & Photo−Triac

TLP525G,TLP525G−2,TLP525G−4

Triac Drive

Programmable Controllers

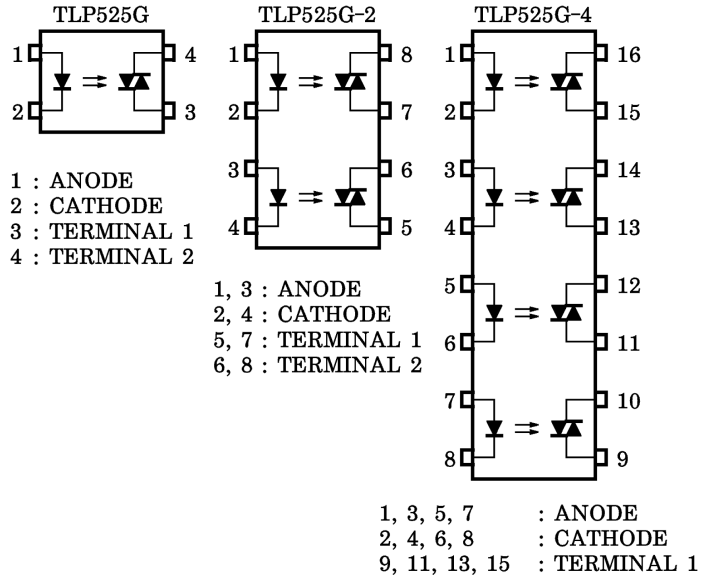
AC−Output Module

Solid State Relay

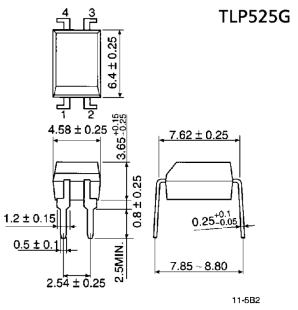
The TOSHIBA TLP525G, −2 and −4 consist of a photo−triac optically coupled to a gallium arsenide infrared emitting diode.
The TLP525G−2 offers two isolated channels in an eight lead plastic DIP package, while the TLP525G−4 provides four isolated channels in a sixteenn lead plastic DIP package.

- Peak off−stage voltage: 400V (min.)
- Trigger LED current: 10mA (max.)
- Peak on−stage current: 2Apk (max.)
- Isolation voltage: 2500V_{rms} (min.)
- UL recognized: File no.E67349

Pin Configurations (top view)

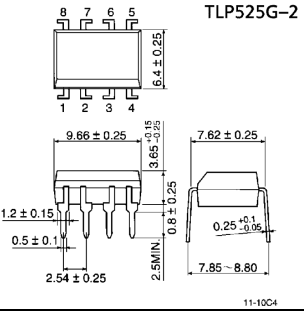

TLP525G
TLP525G-2
TLP525G-4
1 : ANODE
2 : CATHODE
3 : TERMINAL 1
4 : TERMINAL 2
1, 3 : ANODE
2, 4 : CATHODE
5, 7 : TERMINAL 1
6, 8 : TERMINAL 2
1, 3, 5, 7 : ANODE
2, 4, 6, 8 : CATHODE
9, 11, 13, 15 : TERMINAL 1
10, 12, 14, 16 : TERMINAL 2

Unit in mm



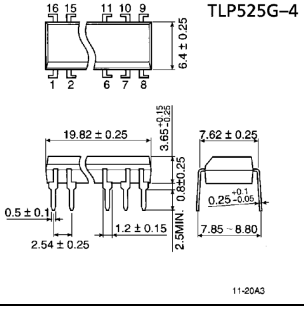
TOSHIBA 11−5B2

Weight: 0.26g



TOSHIBA 11−10C4

Weight: 0.54g



TOSHIBA 11−20A3

Weight: 1.1g

Maximum Ratings (Ta = 25°C)

Characteristic			Symbol	Rating		Unit
				TLP525G	TLP525G−2 TLP525G−4	
LED	Forward current		I_F	50	50	mA
	Forward current derating		I_F / °C	−0.7 (Ta ≥ 53°C)	−0.5 (Ta ≥ 25°C)	mA / °C
	Pulse forward current		I_{FP}	1 (100μs pulse, 100pps)		A
	Reverse voltage		V_R	5		V
	Junction temperature		T_j	125		°C
Detector	Off−state output terminal voltage		V_{DRM}	400		V
	On−state RMS current	Ta = 25°C	$I_{T\ (RMS)}$	100	80	mA
		Ta = 70°C		50	40	
	On−state current derating (Ta≥25°C)		I_T / °C	−1.1	−0.9	mA / °C
	Peak on state current		I_{TP}	2 (100μs pulse, 120pps)		A
	Peak nonrepetitive surge current (P_W = 10ms, DC = 10%)		I_{TSM}	1.2		A
	Junction temperature		T_j	115		°C
Storage temperature range			T_{stg}	−55~125		°C
Operating temperature range			T_{opr}	−40~100		°C
Lead soldering temperature			T_{sol}	260 (10s)		°C
Isolation voltage		(Note)	BV_S	2500 (AC, 1min., R.H. ≤ 60%)		V_{rms}

(Note) Device considered a two terminal device: LED side pins shorted together and detector side pins shorted together.

Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	120	Vac
Forward current	I_F	15	20	25	mA
Peak on−state current	I_{TP}	—	—	1	A
Operating temperature	T_{opr}	−25	—	85	°C

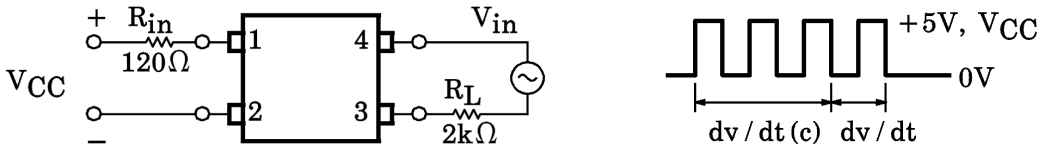
Individual Electrical Characteristics (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F = 10mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1MHz	—	30	—	pF
Detector	Peak off−state current	I_{DRM}	V_{DRM} = 400V	—	10	100	nA
	Peak on−state voltage	V_{TM}	I_{TM} = 100mA	—	1.7	3.0	V
	Holding current	I_H	—	—	0.2	—	mA
	Critical rate of rise of off−state voltage	dv / dt	V_{in} = 120V_{rms}, Ta = 85°C (Figure 1)	200	500	—	V / μs
	Critical rate of rise of commutating voltage	dv / dt (c)	V_{in} = 30V_{rms}, I_T = 15mA (Figure 1)	—	0.2	—	V / μs

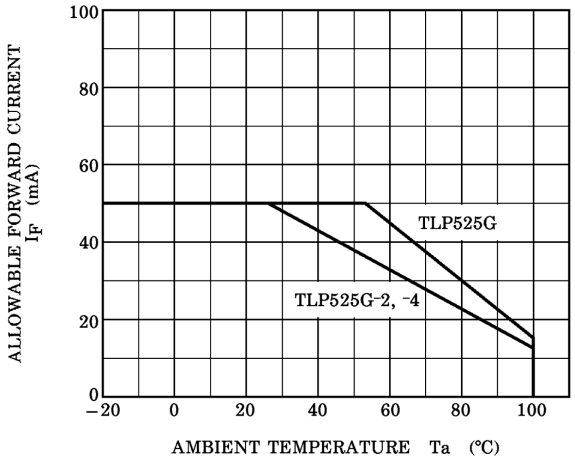
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	V_T = 3V	—	5	10	mA
Capacitance input to output	C_S	V_S = 0, f = 1MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500V, R.H. ≤ 60%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	Vdc

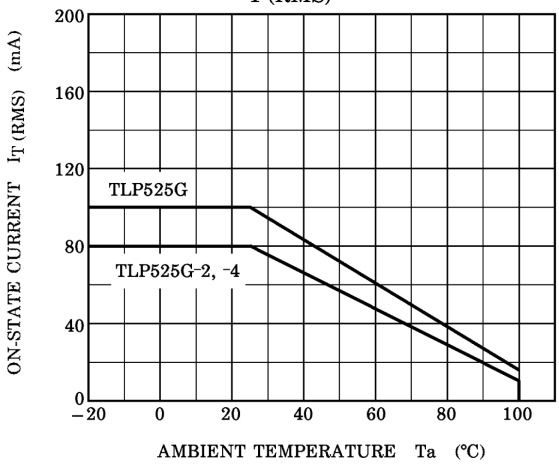
Fig.1 dv / dt Test Circuit



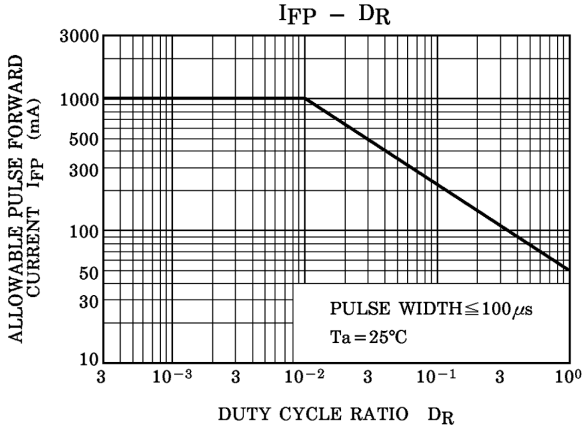
I_F – Ta



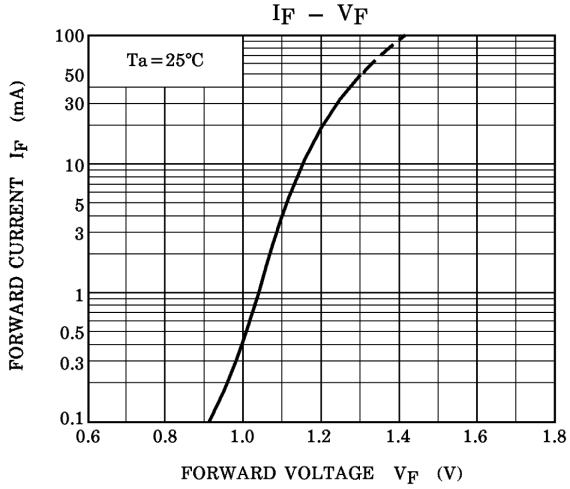
$I_{T\,(RMS)}$ – Ta



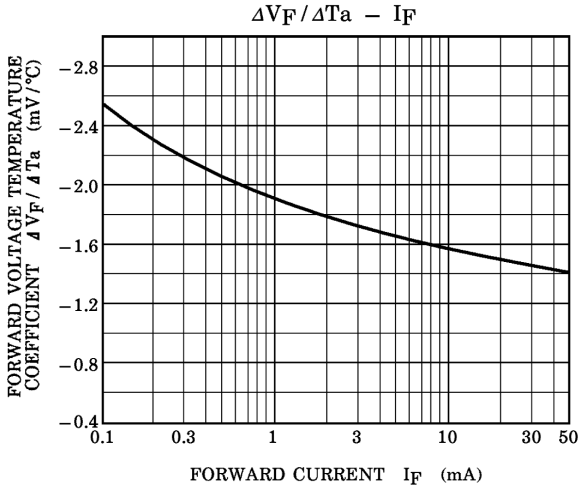
I_{FP} – D_R



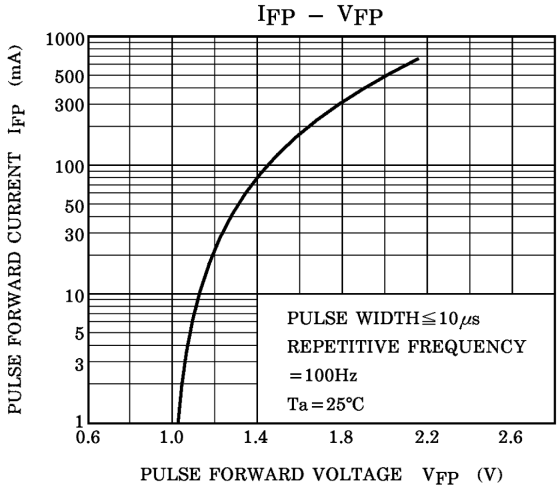
I_F – V_F



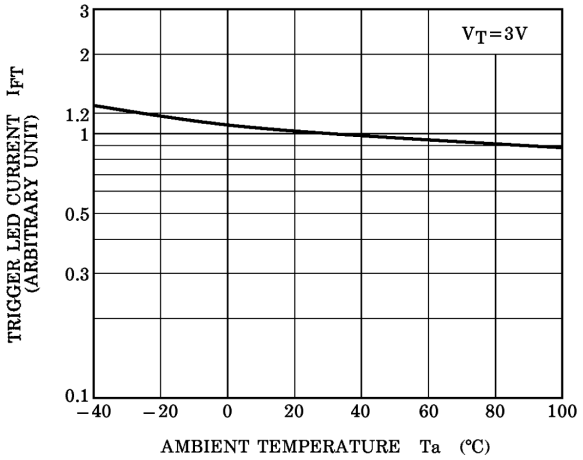
$\Delta V_F / \Delta Ta$ – I_F



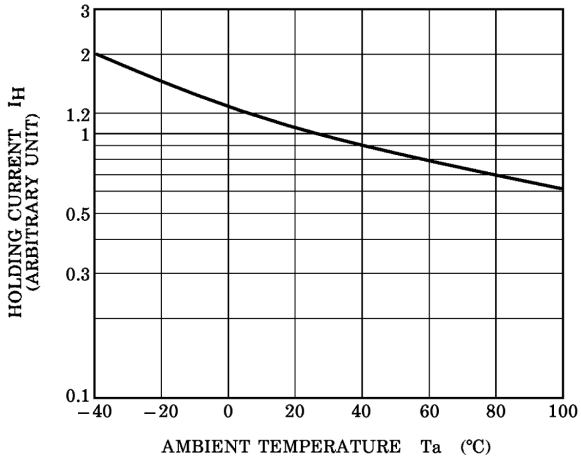
I_{FP} – V_{FP}



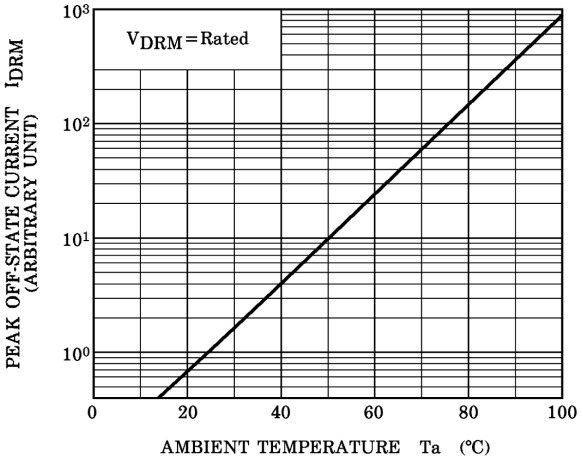
NORMALIZED I_{FT} − Ta



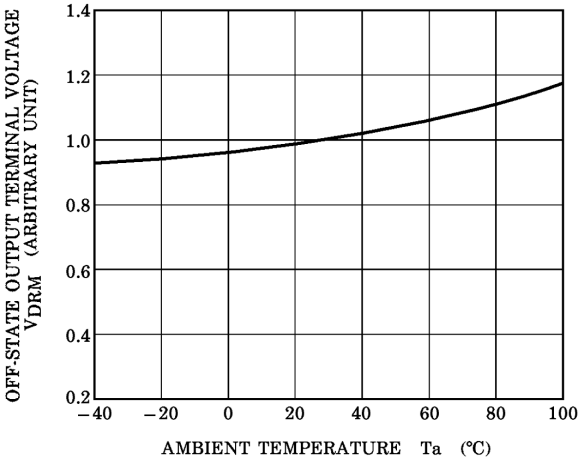
NORMALIZED I_H − Ta



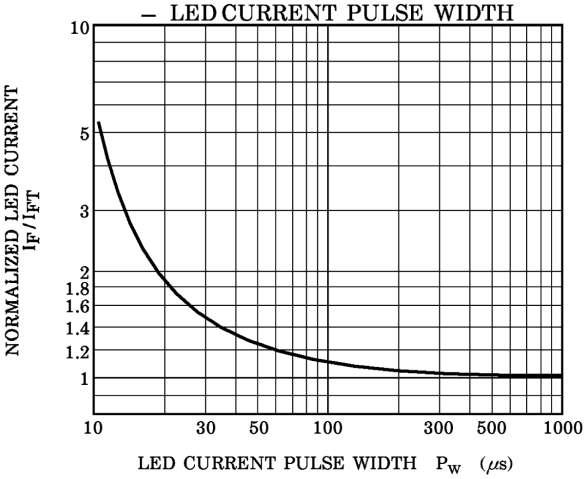
NORMALIZED I_{DRM} − Ta



NORMALIZED V_{DRM} − Ta



NORMALIZED LED CURRENT − LED CURRENT PULSE WIDTH



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000707EAA

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